

REMARKS

Entry of the above amendments and consideration of the following remarks are respectfully requested. Applicants acknowledge that the amendment of any finally rejected claims after final rejection cannot be entered as a matter of right. However, Applicants urge that this amendment places this case in condition for allowance. Upon entry of the above amendments, this application will contain claims 1, 3-6, 8-15, 17, 20, 24, and 25 pending and under consideration.

Claim 22 stands rejected under 35 U.S.C. §103(a) over Rowell (EP 0 213 252 A1). Claims 1, 3-6, 8-16, 20-22, 24, and 25 stand rejected under 35 U.S.C. §103(a) over Sohnius (U.S. 3,607,741) in view of Rowell. Claims 1, 3-6, 11, 15, 17, 20, 22, 24, and 25 stand rejected under 35 U.S.C. §103(a) over Norman et al. (U.S. 4,379,746) in view of Rowell. For more reasons more fully discussed below, it is believed that all of these rejections are overcome and their withdrawal is requested.

Claim 22 stands rejected under 35 U.S.C. §103(a) over Rowell. Applicants have deleted claim 22. Therefore, this rejection is moot.

Claims 1, 3-6, 8-16, 20-22, 24, and 25 stand rejected under 35 U.S.C. §103(a) over Sohnius in view of Rowell. Claims 21 and 22 have been cancelled. Consequently the rejections of these claims are moot.

Applicants respectfully suggest that Sohnius in combination with Rowell do not make the claimed invention obvious. Specifically, the present invention provides unexpected results and advantages that are not suggested or made obvious considering these references either singly or in combination. The claimed invention provides a method of absorbing hydrophobic, water-immiscible liquids with a lignocellulosic plant material, which has been modified by esterification of hydroxyl groups in the lignin of the material. Examples are discussed in the application. A lignocellulose fiber was acetylated according the procedure described in Example 1. The acetylated fiber was evaluated for its ability to recover oil from seawater. The results for the recovery of Medium Fuel Oil (MFO) and transformer oil are provided in the patent application in Example 2 on pages 5 through 7, and these results are reproduced below.

	Oil/Water Weight Gain by Fibres (Multiple of initial fibre weight)	
	MFO*	Transformer Oil
Acetylated fibre	28.1	20.3
Untreated Fibre	30.8	22.4

* Medium Fuel Oil

The application states that the two liquids absorbed by the acetylated fiber for the two sets of tests were analyzed. The recovered liquid absorbed by the acetylated fiber comprised about 70% of MFO oil for the first test and about 80% Transformer Oil for the second test. (Application, p. 6, col. 22, through page 7, col. 31.) These results confirm unprecedented yields for recovery of oil. The acetylated fibres absorbed greater than 19.7 times their initial fibre weight of MFO (70% times 28.1) and greater than 16.2 times their initial fibre weight of transformer oil (80% x 20.3). Thus the claimed invention absorbs a phenomenal amount of oil, which is completely unexpected.

The prior art references confirm that these results are unexpected. Sohnius discloses that the prepared material will only absorb 6.6 times its weight in oil, and it is believed that this efficiency is unparalleled in the present state of the art. (Sohnius, col. 2, line 75, through col. 3, line 1.)

Additionally, Sohnius actually teaches and suggests that one would not expect to improve the oil absorbing capability of the fibers. Sohnius prefaces the above statement by saying that the proportion of water repellent by weight as applied [to the cellulosic material] is 0.5% to 5% of the combined dry weight of the pulp and fibre. “Less than this proportion allows too-rapid water logging of the mass, and more than this proportion does not appreciably improve the oil-gathering capacity.” (*id.*, col. 2, lines 68-72, emphasis added.) Sohnius is indicating that he would not expect any oil-gathering material to absorb more than about 6.6 times its weight in oil regardless of the amount of water repellent that is added to the material. In support, Sohnius specifically indicates that up to 60% total weight of repellent was applied based upon the total weight of the dry fiber --apparently without any significant improvement in oil adsorption. (Sohnius, col. 2, lines 29-40.) In contrast, Applicants’ claimed invention dramatically and

unexpectedly improves the oil absorbing capability of a fibre by chemically modifying the fiber.

Rowell does not make up the deficiencies of Sohnius. Rowell merely discloses a process for acetylating a lignocellulosic material. This reference does not provide any teaching or suggestions regarding the absorption of hydrophobic, water-immiscible liquids onto the chemically modified lignocellulosic material. Thus, this reference does not suggestion to one skilled in the art any modifications of the cellulosic material of Sohnius to arrive at Applicants' claimed invention reciting a chemically modified lignocellulosic material.

Accordingly, Applicants respectfully suggest that the rejections of claims 1, 3-6, 18-16, 20, 24, and 25 are overcome. Consequently, Applicants respectfully request that these rejections be withdrawn.

Claims 1, 3-6, 11, 15, 17, 20, 22, 24, and 25 are rejected under 35 U.S.C. §103(a) over Norman et al. in view of Rowell et al. Claim 22 has been cancelled. This rejection is moot.

Applicant has amended claim 1 by combining claim 1 with the subject matter of claim 16. First, claim 16, which depended from claim 1, was not rejected over the combination of Norman et al. and Rowell. Indicating that Norman et al. and Rowell either singly or in combination do not make the claimed invention obvious.

Secondly, Norman et al. discloses using sodium dispersions to react with and remove polyhalogenated aromatic compounds from hydrocarbon and silicon oils, such as a transformer oil. The process can use a filter system including, among other things, paper, to remove the excess sodium and other particulate matter. The purified, filtered oil is returned to the system from which it is removed. Rowell has been discussed above. One would not be motivated to modify the filter paper of Norman et al. using the method of Rowell to arrive at the Applicants claimed invention. To do so would change the principal operation of Norman et al. and render Norman's invention inoperable. One would not be motivated to modify filter paper to absorb the transformer oil rather than filter the oil and return the filtered oil to the system from which it is removed. (Norman et al., col. 1, line 47, through col. 2, line 4; col. 2, lines 64-line 67.)

In light of the above discussion, Applicants urge that claim 1 as currently amended and claims 3-6, 8-15, 17, and 25 which depend from claim 1 are patentable over the combination of Norman et al. and Rowell.

Applicants have amended claim 20 by adding the subject matter of claim 21. Claim 21, which depends from claim 20 was not rejected. Additionally claim 20 was amended to further clarify that the covering is provided about the modified plant material. Consequently, Applicants request that the rejections of claim 20 as amended and claim 24, which depends from claim 20, over Norman et al. and Rowell be withdrawn.

CONCLUSION

In view of the foregoing discussion, reconsideration and withdrawal of all outstanding rejections, and allowance of this application containing claims 1, 3-6, 8-15, 17, 20, 24, and 25 are requested. In addition, the Examiner is invited to telephone the undersigned attorney if there are any questions about this submission and other formal matters, which might be addressed in that fashion to facilitate allowance of this application.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1 (Twice amended) A method of absorbing hydrophobic water-immiscible liquids from a mixture of such a liquid with water comprising:

treating the mixture [liquid] with lignocellulosic plant material which has been modified by esterification of hydroxyl groups in the lignin of the lignocellulose material such as to render the material more attractive to hydrophobic water-immiscible liquids while still retaining hydrogen bonding to maintain the structural integrity of the material; and

filtering or removing the hydrophobic water-immiscible liquid from the mixture.

20. (Amended) An article for absorbing hydrophobic water-immiscible liquids comprising lignocellulosic plant material which has been rendered relatively more attractive to hydrophobic water-immiscible liquids by esterification of hydroxyl groups in the lignin of the plant material, and a covering material provided around the modified plant material through which the hydrophobic liquid may pass [provided around the modified plant material], wherein the article is in the form of a boom or pillow.